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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Christophe LE ROY et al.

(IN TRIPLICATE)

Serial No.: 09/777,012

Examiner: Marc A. Patterson

Filed: February 6, 2001

Group Art Unit: 1772

Title: MULTILAYER STRUCTURE AND TANK CONSISTING OF THIS
STRUCTURE, WHICH HAS A BARRIER LAYER IN DIRECT CONTACT
WITH THE FLUID CONTAINED

BRIEF ON APPEAL UNDER 37 C.F.R. § 1.192

Mail Stop Appeal Brief-Patents

Commissioner for Patents

P.O. Box 1450

ALEXANDRIA, VA 22313-1450

Sir:

This is an appeal from the decision of the Examiner finally rejecting claims 21-32 and
35-49 of the above-identified application.

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(1) REAL PARTY IN INTEREST

The application is assigned of record to ATOFINA, who is the real party in interest
herein.

(2) RELATED APPEALS AND INTERFERENCES

Appellants, their legal representative and the assignee are not aware of any related
appeals or interferences which will directly affect or be directly affected by or have a bearing
on the Board's decision in the instant appeal.

(3) STATUS OF THE CLAIMS

Claims rejected: Claims 21-32 and 35-49.

Claims allowed: None

Claims canceled: Claims 1-20 and 33-34.

Claims withdrawn: None

Claims on Appeal: Claims 21-32 and 35-49 (a copy of the claims on appeal is provided in the attached Appendix).

(4) STATUS OF AMENDMENTS AFTER FINAL

No amendments after the Final Rejection need be entered.

(5) SUMMARY OF THE INVENTION

Appellants' invention is directed to a layered structure which is useful for making articles for transferring or storing fluids. The novel layered structure provides a barrier layer effect which prevents the loss of volatiles through articles made from it, e.g., in tubes, tanks, or other containers. The structure is particularly useful in articles for transferring or storing petrol (i.e., gasoline) in motor vehicles since it avoids the loss of volatiles from the gasoline and, thus, avoids polluting the environment. See, e.g., page 1, first two paragraphs, of the original disclosure.

The structure of the broadest claim on appeal (i.e., claim 21) has the following layers, in succession:

- a first layer of high density polyethylene (HDPE)
- a layer of binder,
- a second layer of an ethylene-vinyl alcohol (EVOH) copolymer or of a mixture based on an EVOH copolymer, and

- a third layer of a mixture of a polyamide (A) and a polyolefin (B), where the polyolefin (B) is specifically defined by two mixtures of particular components as recited in claim 21, on appeal.

See, e.g., page 3, first three full paragraphs, and page 15, line 31, to page 16, line 8, of the original disclosure.

The structure may also contain a binder layer between the second and third layers; see, e.g., page 23, lines 19-20, of the original disclosure, and other more specified embodiments are recited in the dependent claims and supported by the original disclosure.

(6) ISSUES

1. Whether or not claims 21-28, 31-32 and 38-46, on appeal, are properly rejected under 35 U.S.C. § 103, as being obvious over Beuzelin (UK Patent No. 2288177) in view of Hughes (U.S. Patent No. 5,705,565).

2. Whether or not claim 29, on appeal, is are properly rejected under 35 U.S.C. § 103, as being obvious over Beuzelin in view of Hughes, as applied above, further in view of Zhang (U.S. Patent No. 5,516,583).

3. Whether or not claims 30 and 35-37, on appeal, are properly rejected under 35 U.S.C. § 103, as being obvious over Beuzelin in view of Hughes, as applied above, further in view of Melot (U.S. Patent No. 5,998,545).

4. Whether or not claims 47-49, on appeal, are properly rejected under 35 U.S.C. § 103, as being obvious over Beuzelin in view of Hughes, as applied above, further in view of

Hata (U.S. Patent No. 6,033,749).

(7) GROUPING OF THE CLAIMS

As to Issue 1

Claims 21, 23-25, 32 and 40-42, on appeal, are grouped together.

Claims 22, 38 and 39, on appeal, are separately grouped together for the reasons given in the argument.

Claims 27 and 28, on appeal, are separately grouped together for the reasons given in the argument.

Claims 31 and 43, on appeal, are separately grouped together for the reasons given in the argument.

Claim 44, on appeal, is separately grouped for the reasons given in the argument.

Claim 45, on appeal, is separately grouped together for the reasons given in the argument.

Claim 46, on appeal, is separately grouped together for the reasons given in the argument.

As to Issue 2

This issue pertains to only a single claim.

As to Issue 3

Claims 30 and 35-37, on appeal, stand or fall together.

As to Issue 4

Claims 47 and 48, on appeal, are grouped together.

Claim 49, on appeal, is separately grouped for the reasons given in the argument.

(8) APPELLANTS' ARGUMENTS

1a. Claims 21, 23-25, 32 and 40-42, on appeal, are not obvious to one of ordinary skill in the art from Beuzelin in view of Hughes and, thus, are not properly rejected under 35 U.S.C. § 103.

Beuzelin is directed principally to binder compositions for use in co-extruded multilayer compositions. The binder compositions are disclosed to be particularly useful in binding multilayer composites having an outer layer of polystyrene, commonly employed for food containers or lids; see, e.g., page 1, lines 3-13. Beuzelin provides a broad definition of the binder compositions encompassed therein. There are many possible variations; see, e.g., page 3, line 9, to page 5, line 11. All of the binder compositions of Beuzelin require a styrene polymer component, i.e., Beuzelin requires a polymer (A) which is one of (A1), (A2), (A3) or (A4) each of which require a component (a) styrene homopolymer or copolymer or (b) a styrene-diene elastomer block polymer. Beuzelin describes the type of multilayer constructions to be prepared using its binders generally at page 12, line 18, to page 13, line 15.

The basis for the rejection of claim 21, on appeal, appears to be as follows. Beuzelin's disclosure of the structure "PS/binder/EVOH/binder/PO" (page 13, lines 10-11) provides, successively, a "first layer" of polyolefin which can be HDPE, a layer of binder, a "second layer" of an EVOH copolymer and a binder layer which allegedly reads on the "third layer" of claim 21, on appeal, except that it lacks a polyamide component. Hughes (discussed in

more detail below) allegedly suggests combining a polyamide component into the binder of Beuzelin, thus, suggesting modifying Beuzelin in a manner such that the binder layer meets the recitations of appellants' "third layer."

Appellants respectfully disagree with the rejection because:

- (1) the binder layer of Beuzelin cannot be considered the meet the "third layer" recitation of claim 21, on appeal,
- (2) one of ordinary skill in the art would not have been motivated to combine the Hughes teaching with Beuzelin, and
- (3) even if the combination of the Hughes and Beuzelin was proper, there is no fair suggestion to combine them in a manner which would arrive at a binder having the components of appellants' "third layer."

As to point (1) above, the binder of Beuzelin cannot satisfy the "third layer" recitation of the instant claims. In this art, one of ordinary skill in the art would know that a binder layer is distinct from a structural layer and it is clear from the claims that appellants' third layer is a structural layer, not a binder layer. A binder layer differs from a structural layer in its form, i.e., being much thinner, and function, i.e., for attaching two adjoining layers. Beuzelin itself evidences the distinction between a binder layer and other layers. At pages 12 and 13, Beuzelin differentiates the binder layers from the other types of layers. In the Beuzelin embodiment PS/binder/EVOH/binder/PO, where PO is the first layer and EVOH is the second layer, the PS layer would be the third layer, not the binder layer. Thus, the initial premise for the rejection, i.e., that the binder of Beuzelin corresponds to the third layer of the claimed invention, is not a reasonable interpretation of the Beuzelin teachings. The distinction is further evidenced in the instant disclosure which also discusses binder layers as separate from the first, second and third layers. This is also reflected in the claims on appeal

(see also the separate argument regarding claim 22 below in this regard). The claims make clear to one of ordinary skill in the art that the first, second and third layers of the instant claims are not binder layers. Accordingly, Beuzelin, whether combined with Hughes or not, provides no suggestion at all of a "third layer" having a mixture of a polyamide (A) and a polyolefin (B), as defined by claim 21, on appeal. The PS layer would be the third layer in Beuzelin and it is clearly distinct from the third layer of claim 21, an appeal

As to point (2) above, even if the Beuzelin binder is considered as appellants' third layer, the claimed invention is not suggested by the cited prior art. It was recognized in the Final Office Action (page 2) that Beuzelin fails to disclose a binder which contains a polyamide. Thus, the combination with Hughes was relied upon. It is alleged in support of the rejection that Hughes suggests that a composition comprising high-density polyethylene (HDPE) and low-density polyethylene (LDPE) is equivalent to a composition containing HDPE, LDPE and a polyamide, for use as a binder layer having desirable adhesive properties. This is not a correct interpretation of the Hughes reference, however.

Hughes is directed to a graft-modified ethylene polymer where the ethylene polymer is, particularly, a substantially linear ethylene polymer. Hughes teaches that the adhesive properties of its graft polymer are improved due to the use of the substantially linear ethylene polymer. See, e.g., col. 1, lines 58-64. Hughes teaches several separate uses for its graft polymers. They are taught for use:

- as compatibilizers for filled resinous products; see, e.g., col. 4, lines 24-61;
- blended with other polymers for used in preparing molded or shaped articles; see, e.g., col. 4, line 62, to col. 5, lines 59, and col. 2, lines 4-7;
- in providing paintability to a molded article surface; see, e.g., col. 5, line 60, to col. 6, line 2; and

- in providing an adhesive film (i.e., a binder layer) between other polymer layers; see, e.g., col. 6, lines 2-12.

The only use for which Hughes suggests adding other polymers to its special ethylene graft polymer is in making molded or extruded shaped articles. Only here (see col. 4, line 62, to col. 5, line 59) is there a suggestion to use the special graft polymer together with any of a number of other polymers, including other olefin or non-olefin polymers. It is only for this use in making molded or extruded shaped articles that Hughes suggests blending its special graft polymer with a polymer such as a polyamide, among many other possible polymers. When Hughes discusses the separate use of its special graft polymer as an adhesive layer or binder (col. 6, lines 2-12), it provides no suggestion at all to combine the polymer with any other olefin or non-olefin polymer. While Hughes discloses that the adhesive layer can be used to bind a polyolefin layer to a separate layer, such as polyamide, there is no disclosure to include a polyamide in the adhesive binder layer. The Hughes examples also demonstrate this fact. When testing its graft polymers for adhesive properties, Hughes uses a layer containing only the grafted substantially linear ethylene polymer, no other polymers; see, col. 8, lines 9-62. Other polymers, such as polyamides, are added to the grafted polymer only when testing impact/strength-related properties of molded articles or when testing as compatibilizers; see, col. 8, line 63, to col. 9, line 64, and cols. 14-17.

Further, the Hughes teachings regarding providing an adhesive layer do not relate to adhesive layers containing a polystyrene component. Thus, in the first place, one of ordinary skill in the art would not even consider such teachings for modifying a binder such as Beuzelin, which is principally based on a polystyrene component.

Even disregarding the point in the above paragraph, one of ordinary skill in the art, looking to modify the binder layer of Beuzelin and considering Hughes, would only

reasonably look to the teachings of Hughes which relate to providing an adhesive film as a tie layer between other polymer layers. These teachings suggest nothing regarding adding a polyamide component to the adhesive layer. Hughes does not suggest providing a binder or adhesive which contains a polyamide together with its grafted substantially linear polyethylene. And it would not suggest replacing or modifying the binder layer in Beuzelin to provide a polyamide in its binder layer. Hughes only suggests combining a polyamide with its special grafted polymer when preparing shaped articles to improve their impact properties. Since Beuzelin does not relate to such a use, there would be no motivation to one of ordinary skill in the art use Hughes' polyamide-containing blends in the Beuzelin layered materials. Further, Hughes makes no suggestion that any of the polyamide or other additional polymers would aid in the adhesive properties. To the contrary, Hughes uses only the grafted substantially linear ethylene polymer when adhesiveness/binder properties are desired, thus, suggesting that other components would, if anything, be detrimental to the adhesive effect. As a whole, there are no teachings in the cited prior art to one of ordinary skill in the art of the desirability of modifying the Beuzelin binder to add a polyamide. Absent such desirability, there is no motivation for the modification. See In re Laskowski, 10 USPQ2d 1397 (Fed. Cir. 1989); and, In re Geiger, 2 USPQ2d 1276 (Fed. Cir. 1987).

At least for these reasons, the rejections should be reversed. Beuzelin and Hughes are not properly combinable in a manner which suggests appellants' invention having a polyamide component in the third layer.

Regarding point (3) above, even if Hughes were combinable with Beuzelin regarding its polyamide teachings, the combined teachings of these references would not fairly suggest appellants' invention. Claim 21, on appeal, literally recites a very specific combination of components for the third layer, i.e., the third layer either comprises:

- (1) a mixture of a polyamide component and a polyolefin component, where the polyolefin component is a mixture of (a) a HDPE polymer, (b) a C2 polymer (i.e., elastomer, VLDPE or ethylene copolymer, defined at page 17, lines 10-21, of the instant specification, for example), which C2 polymer is grafted, and (c) a C2 polymer which is not grafted; or
- (2) a mixture of a polyamide component and a polyolefin component, where the polyolefin component includes HDPE and a mixture of a polyethylene and a C2 polymer which are co-grafted.

As to the alternative (1) for the third layer, even if the Beuzelin “binder” modified by adding any component disclosed by Hughes generically encompasses the possibility of a mixture of polyamide, HDPE and C2 polymers both grafted and ungrafted, it certainly encompasses hundreds, if not thousands, of other possibilities which are not such a mixture. The definition of the binder at pages 3-5 of Beuzelin contains so many possible alternative permutations that it cannot fairly suggest picking out a combination of HDPE, a C2 grafted polymer, a C2 non-grafted polymer from Beuzelin and combine those with a polyamide from Hughes. The only suggestion for picking out the components from Beuzelin and Hughes to arrive at appellants’ four component first embodiment for the “third layer” is by using appellants’ own disclosure as a blueprint or guide to select this particular combination of components. Such use of appellants’ own disclosure does not properly support obviousness under 35 U.S.C. § 103; see, e.g., Grain Processing v. American Maize, 5 USPQ2d 1788, 1792 (Fed. Cir. 1988); and Orthopedic Equipment Co., Inc. v. United States, 217 USPQ 193, 199 (Fed. Cir. 1983). Additionally, the specific embodiments and examples which are disclosed in Beuzelin and Hughes are nothing like this embodiment of appellants’ third layer. So, they also give no direction towards the claimed invention.

As to alternative (2) for the third layer (see also claim 31, on appeal, directed to this embodiment), Beuzelin does not even generically encompass or suggest any embodiment which includes a co-graft of polyethylene and a C2 polymer. The only co-grafts generically included in the Beuzelin binders are co-grafts with polystyrene, which is not a C2 component of appellants' invention. (See, page 17, lines 10-21, of the instant specification). Given the hundreds, if not thousands, of possible permutations generically encompassed in the definition of the Beuzelin binder, the fact that appellants' embodiment is not even encompassed by such a broad disclosure irrefutably establishes that this embodiment is not suggested by the prior art. The Final Office Action states on page 6, first paragraph, that Beuzelin suggests HDPE plus LDPE co-grafted with an unsaturated carboxylic acid, and refers to page 9, lines 7-19, and page 5, lines 16-23, of Beuzelin as supporting this. But the section from page 9 discussing ethylene polymers (c) for grafting relates to the polymers which are co-grafted with a polymer (a), i.e., styrene, to make the A3 co-grafted component. The A3 co-graft is a co-graft of a styrene polymer and an ethylene polymer, not a co-graft according to the instant claims. There is no suggestion from Beuzelin to co-graft two (c) polymers from its list on page 9; see the definition of the (A3) component at page 3, line 28, to page 4, line 15, of Beuzelin. Thus, Beuzelin provides no suggestion of any co-graft component meeting this embodiment of the claims on appeal.

Further, even if one of ordinary skill in the art could pick components out of Beuzelin and Hughes to re-construct appellants alternative (2) with a co-graft included in the third layer, for reasons analogous to those discussed above, the only motivation for such picking and choosing would, impermissibly, come from the use of appellants' own disclosure as a blueprint.

In connection with the above discussion, the nonobviousness of picking and choosing from Beuzelin's vague and generic disclosure the necessary components (some of which are not even generically encompassed) to arrive at appellants' polyolefin component is further compounded by the necessity to also combine the alleged suggestion of additional components from Hughes to piece together appellants' third layer. In addition to all the possible permutations of Beuzelin's binder, one of ordinary skill in the art – if they were to improperly combine Hughes' teachings – would not necessarily select combining a polyamide from the Hughes teachings. Hughes teaches a large number of possible additional polymers for its shaped articles use embodiments; see, e.g., col. 5 of Hughes. Again, the only suggestion to pick a polyamide from such possibilities is by use of appellants' own disclosure as a blueprint for piecing together the claimed invention. Such analysis does not properly support a rejection under 35 U.S.C. § 103.

For all of the above reasons – and particularly in view of the combination of all of these reasons – it is urged that the prior art, considered as a whole, fails to render the claimed invention obvious to one of ordinary skill in the art. To arrive at appellants' invention, one of ordinary skill in the art would have to:

- select one particular multi-layer combination from the many possible layer structures encompassed by Beuzelin,
- make the leap of treating a binder layer of Beuzelin as appellants' third layer, (even though both Beuzelin and the instant disclosure distinguish binder layers from the other layers),
- provide a particular combination of polyolefin components in the binder of Beuzelin from among the hundreds – even thousands – of possibilities encompassed by the reference (or even go outside this broad genus),

- add a further polymer component from Hughes to such binder despite the lack of any suggestion thereof in Beuzelin, despite that Hughes provides no teachings applicable to polystyrene-based binders, and despite teachings in Hughes that such additional polymers are for uses unrelated to binder layers and that, for binder layer uses, no additional polymer is added, and
- choose, from among the large number of possible additional polymers in Hughes, a polyamide component for addition to the Beuzelin binder.

Appellants urge that the art fails to provide the necessary motivation for any of these steps, let alone the need to combine all of these steps to arrive at appellants' invention. The piecing together of different teachings of the references without the requisite motivation does not establish obviousness under 35 U.S.C. §103.

Accordingly, the rejection of claims 21, 23-25, 32 and 40-42, on appeal, is not supported by the cited prior art and the 35 U.S.C. §103 rejection should be reversed.

1b. Claims 22, 38 and 39, on appeal, are not obvious to one of ordinary skill in the art from Beuzelin in view of Hughes and, thus, are not properly rejected under 35 U.S.C. § 103.

The arguments from Issue 1a all apply equally here and are incorporated by reference.

Claim 22, on appeal, reciting a further binder layer between the second and the third layer, provides an even more convincing distinction from the cited prior art. The premise for the primary statement of the rejection is that a binder layer of Beuzelin meets the limitations of the "third layer" recited in the instant claims. Although appellants vigorously dispute this above, if it were true, then claims 22, 38 and 39, on appeal, would still be distinguished. If the binder layer of Beuzelin is considered the third layer of appellants' invention, then

Beuzelin provides no suggestion of an embodiment which contains an additional binder layer between the second and third layer, as recited in the claims at issue here.

The Final Office Action, page 4, states that it would be obvious to repeat a prior art element, thus, apparently providing a Beuzelin binder layer meeting appellants' binder and an additional binder layer on the other binder layer meeting appellants' third layer, citing *St. Regis Paper v. Bemis*, 193 USPQ 8, in support.

Appellants submit that the case law does not support this conclusion on the instant facts. The combination in *St. Regis* was obvious because there was motivation in the art to add an additional layer to meet the stated objective of strengthening the bag. There was some purpose, and thus motivation, to make the duplication. Here, there is no motivation to provide an additional adhesive binder layer when one already exists. Adhesive layers provide an adhesive effect based on their contact surface. Adding a further binder layer on top of the other binder layer would not increase the contact surface. One of ordinary skill in the art would see no need, and thus have no motivation, to provide a binder layer to bind to another binder layer. There is nothing in the art to motivate such unnecessary and potentially detrimental duplication.

For all of these reasons, the rejection of claim 22, 38 and 39 on appeal, is not supported by the cited prior art and the 35 U.S.C. §103 rejection should be reversed.

1c. Claims 27 and 28, on appeal, are not obvious to one of ordinary skill in the art from Beuzelin in view of Hughes and, thus, are not properly rejected under 35 U.S.C. § 103.

The arguments from Issue 1a all apply equally here and are incorporated by reference.

Claims 27 and 28, on appeal, reciting more specified embodiments of the binder of appellants' layer structure, provide an even more convincing distinction from the cited prior

art. The binder of Beuzelin is a coextrusion binder composition described at page 3, line 9, to page 5, line 11. There are many variables from which to choose in this broadly described binder. It is clear, however, that a primary requirement of the Beuzelin binders is that they contain a significant styrene polymer component; see the definition of Beuzelin's polymer (A) at pages 3-4 and the need for compatibility with the polystyrene layers used in Beuzelin's structure. Accordingly, Beuzelin does not disclose a structure having a binder of polyethylene grafted with maleic anhydride, let alone one having specific further properties. Also, modification of Beuzelin to provide such a binder without a significant styrene polymer component would be contrary to the objectives of Beuzelin and, thus, there would be no motivation from Beuzelin for one of ordinary skill in the art to make such a modification. Hughes also provides no motivation for one of ordinary skill in the art to modify the Beuzelin binder in a manner which is contrary to its objectives. Further, it would not have been obvious to replace the Beuzelin binder with the embodiments of the Hughes films described as being adhesive. Hughes does not describe its adhesive films as being useful for binding a polystyrene-containing layer. Thus, there would be no motivation to use the Hughes films as binders in Beuzelin.

For all of these reasons, the rejection of claims, 27 and 28, on appeal, is not supported by the cited prior art and the 35 U.S.C. §103 rejection should be reversed.

1d. Claims 31 and 43, on appeal, are not obvious to one of ordinary skill in the art from Beuzelin in view of Hughes and, thus, are not properly rejected under 35 U.S.C. § 103.

The arguments from Issue 1a all apply equally here and are incorporated by reference. Claim 31, on appeal, reciting a more specific embodiment of the polyolefin in the third layer, provides an even more convincing distinction of this claim and claim 43 dependent thereon

from the cited prior art.

Claim 31 is directed particularly to the alternative (2) for the third layer discussed above in Issue 1a. The discussion there is repeated below.

Beuzelin does not generically encompass or suggest any embodiment of its binder (as the third layer of the instant claims) which is a mixture of high density polyethylene mixed with a co-graft of polyethylene and a polymer (C2) selected from the group consisting of elastomers, very low density polyethylenes and ethylene copolymers (see page 17, lines 10-21, of the instant specification). The only co-grafts even broadly generically included for the Beuzelin binders are co-grafts of a styrene polymer (not within the C2 component of appellants' invention) with an ethylene polymer. Given the hundreds, if not thousands, of possible permutations generically encompassed in the definition of the Beuzelin binder, the fact that appellants' embodiment is not even encompassed within such a broad disclosure convincingly establishes that appellants' embodiment is not suggested thereby. The Final Office Action states on page 6 that Beuzelin suggests HDPE plus LDPE co-grafted with an unsaturated carboxylic acid, and refers to page 9, lines 7-19, and page 5, lines 16-23, of Beuzelin as supporting this. But these cited sections discuss ethylene polymers (c) for co-grafting with a polymer (a), i.e., a styrene polymer, to make the A3 co-grafted component; see page 3, line 28, to page 4, line 15, of Beuzelin. There is no suggestion from Beuzelin to co-graft two (c) polymers from the list on page 9 or otherwise co-graft any ethylene polymer with anything other than a styrene polymer.

The case for nonobviousness is even stronger with regard to claim 43 reciting particularized amounts of the third layer components. As discussed above, the combined reference teachings fail to point to a third layer meeting all the requirements of claim 21 or claim 31. The further requirements of claim 43 are even more remote from the references'

teachings and even more clearly not suggested to one of ordinary skill in the art.

For all of these reasons, the rejection of claims 31 and 43, on appeal, is not supported by the cited prior art and the 35 U.S.C. §103 rejection should be reversed.

1e. Claim 44, on appeal, is not obvious to one of ordinary skill in the art from Beuzelin in view of Hughes and, thus, are not properly rejected under 35 U.S.C. § 103.

The arguments from Issue 1a all apply equally here and are incorporated by reference.

But the case for nonobviousness is even stronger with regard to claim 44 reciting particularized amounts of the third layer components. As discussed above, the combined reference teachings fail to point to a third layer meeting all the requirements of claim 21 or claim 32. The further requirements of claim 44 are even more remote from the references' teachings and even more clearly not suggested to one of ordinary skill in the art.

For all of these reasons, the rejection of claims 32 and 44, on appeal, is not supported by the cited prior art and the 35 U.S.C. §103 rejection should be reversed.

1f. Claim 45, on appeal, is not obvious to one of ordinary skill in the art from Beuzelin in view of Hughes and, thus, is not properly rejected under 35 U.S.C. § 103.

The arguments from Issue 1a all apply equally here and are incorporated by reference. Claim 45, on appeal, reciting a particular polyamide for the polyamide in the third layer, provides an even more convincing distinction from the cited prior art.

As established, Beuzelin discloses nothing regarding a polyamide in its binder layer, which binder layer allegedly corresponds to appellants' third layer. Hughes was cited in the rejection as teaching inclusion of a polyamide in the Beuzelin binder. Although vigorously disputed by appellants above, even if Hughes did suggest adding a polyamide to the Beuzelin

binder, Hughes teaches nothing regarding any specific polyamide and certainly nothing regarding a "PA 6/6-6 copolymer of caprolactam, adipic acid and hexamethylenediamine" as the polyamide. Thus, there is no suggestion of claim 45, on appeal.

For all of these reasons, the rejection of claim 45, on appeal, is not supported by the cited prior art and the 35 U.S.C. §103 rejection should be reversed.

1g. Claim 46, on appeal, is not obvious to one of ordinary skill in the art from Beuzelin in view of Hughes and, thus, is not properly rejected under 35 U.S.C. § 103.

The arguments from Issue 1a all apply equally here and are incorporated by reference. Claim 46, on appeal, reciting specified thicknesses of the first, second and third layers, provides an even more convincing distinction from the cited prior art.

Beuzelin is directed to the nature of its binder. Beuzelin discusses the total thickness of its layer combinations and of the relative thicknesses of the polystyrene layer component, the sealing layer and the binder component; see e.g. pages 14-15. But the polystyrene layer of Beuzelin is not one of appellants first, second or third layers and neither is the binder layer. Thus, one of ordinary skill in the art could not arrive at the specific layer thicknesses of the instant claims from the teachings or suggestions of Beuzelin. Hughes adds nothing regarding layer thickness.

For all of these reasons, the rejection of claim 46, on appeal, is not supported by the cited prior art and the 35 U.S.C. §103 rejection should be reversed.

2. Claim 29, on appeal, is not obvious to one of ordinary skill in the art over Beuzelin in view of Hughes, as applied above, further in view of Zhang and, thus, is not properly rejected under 35 U.S.C. § 103.

This ground of rejection necessarily relies on the propriety of the rejection of claim 21 over Beuzelin in view of Hughes. Thus, the discussion above in Issue 1a applies fully here and is incorporated herein by reference. The Zhang reference was cited for alleged teachings regarding the dependent claim 29 aspects. It was not cited for – and does not teach or suggest – modification of the Beuzelin or Hughes structure in any manner which makes up for the above-noted deficiencies of these references. Thus, the combination of Zhang with Beuzelin and Hughes fail to render the claimed invention obvious for the same reasons as discussed above.

For these reasons, the rejection of claim 29, on appeal, is not supported by the cited prior art and the 35 U.S.C. §103 rejection should be reversed.

3. Claims 30 and 35-37, on appeal, are not obvious to one of ordinary skill in the art over Beuzelin in view of Hughes, as applied above, further in view of Melot and, thus, are not properly rejected under 35 U.S.C. § 103.

This ground of rejection necessarily relies on the propriety of the rejection of claim 21 over Beuzelin in view of Hughes. Thus, the discussion above in Issue 1a applies fully here and is incorporated herein by reference. The Melot reference was cited for alleged teachings regarding dependent claims 30 and 35-37 aspects. It was not cited for – and does not teach or suggest – modification of the Beuzelin or Hughes structure in any manner which makes up for the above-noted deficiencies of these references. Thus, Melot's combined teachings with Beuzelin and Hughes fails to render the claimed invention obvious for the same reasons as discussed above.

Furthermore, it is urged that there is no motivation to one of ordinary skill in the art to combine Melot with the Beuzelin and Hughes teachings. Melot appears to provide no

teachings regarding the utility of its materials. Certainly, there is no teaching that its materials are useful as binder layer or have adhesive properties. Thus, it is urged that one of ordinary skill in the art would not have been motivated to look to the Melot teachings for modifying the binder compositions of Beuzelin (or such compositions further modified by Hughes).

For these reasons, the rejection of claims 30 and 35-37, on appeal, is not supported by the cited prior art and the 35 U.S.C. §103 rejection should be reversed.

4a. Claims 47-48, on appeal, are not obvious to one of ordinary skill in the art over Beuzelin in view of Hughes, as applied above, further in view of Hata and, thus, are not properly rejected under 35 U.S.C. § 103.

This ground of rejection necessarily relies on the propriety of the rejection of claim 21 over Beuzelin in view of Hughes. Thus, the discussion above in Issue 1a applies fully here and is incorporated herein by reference. The Hata reference was cited for alleged teachings regarding dependent claims 47-49 aspects. It was not cited for – and does not teach or suggest – modification of the Beuzelin or Hughes structure in any manner which makes up for the above-noted deficiencies of these references. Thus, Hata's combined teachings with Beuzelin and Hughes fails to render the claimed invention obvious for the same reasons as discussed above.

Furthermore, it is urged that there is no motivation to one of ordinary skill in the art to combine Hata with the Beuzelin and Hughes teachings. The Final Office Action (page 10) states that "one of ordinary skill in the art would have recognized the utility of providing for the fuel tank of Hata et al as the container of Beuzelin et al and Hughes et al, depending on the impermeability to oxygen-containing petrol of the end product as taught by Hata et al."

The meaning of this statement is not clear to Appellants but, apparently, it is being alleged that it would have been obvious to use the Beuzelin layered materials, as modified by Hughes, for a fuel tank application. If this is what the intention was, Appellants fail to see why one of ordinary skill in the art would have expected the layered materials of Beuzelin, as modified by Hughes, to be useful as fuel tank materials. The principle construction layer of the Beuzelin materials is an outer polystyrene layer and the materials are taught principally for use in making polystyrene cups and food containers; see, e.g., page 1 and page 15, last full paragraph, of Beuzelin. There is no suggestion that such materials would have properties making them suitable for fuel tank construction. The Hata materials are used for fuel tank construction but they have a quite different structure from the Beuzelin materials, since they have no styrene polymer layer, which is a principal requirement of the Beuzelin materials. Due to this distinction, one of ordinary skill in the art would not have been motivated by Hata to provide a fuel tank constructed from the materials of Beuzelin (or such materials further modified by Hughes).

For these reasons, the rejection of claims 47 and 48, on appeal, is not supported by the cited prior art and the 35 U.S.C. §103 rejection should be reversed.

4b. Claim 49, on appeal, is not obvious to one of ordinary skill in the art over Beuzelin in view of Hughes, as applied above, further in view of Hata and, thus, is not properly rejected under 35 U.S.C. § 103.

All of the above arguments made regarding Issue 4a apply equally here and are incorporated herein by reference.

Claim 49, on appeal, is even further distinguished. Claim 49 recites the “consisting essentially of” language and, thus, excludes an additional layer, such as the required

polystyrene layer of Beuzelin. In the Final Office Action, this claim was addressed together with claims 47 and 48, although it is an altogether different claim. Claim 49 depends on claim 21 and is not limited to a fuel tank or other petrol container. There are no teachings from Hata which would motivate one of ordinary skill in the art to modify the Beuzelin materials to remove the polystyrene layer therefrom. Further, one of ordinary skill in the art would never have been motivated to modify Beuzelin in this manner because such would remove the principle structural feature of the Beuzelin layered materials. Looking at the constructs of Beuzelin on page 13, lines 9-15, it should be evident that the polystyrene ("PS") layer is the only required structural layer in the Beuzelin materials. One of ordinary skill in the art would have to have very strong motivation to remove such a layer from the Beuzelin materials and no such motivation exists here.


For these reasons, the rejection of claim 49, on appeal, is not supported by the cited prior art and the 35 U.S.C. §103 rejection should be reversed.

(9) CONCLUSION

For all of the above reasons, it is urged that the decision of the Examiner rejecting claims 21-28, 31-32 and 38-46, on appeal, is in error and should be reversed.

The Commissioner is hereby authorized to charge any fees associated with this reply or credit any overpayment to Deposit Account No. 13-3402.

Respectfully submitted,



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APPENDIX OF CLAIMS:

1. - 20. (Canceled)

21. A structure comprising, successively:

- a first layer of high density polyethylene (HDPE)
- a layer of binder,
- a second layer of an ethylene-vinyl alcohol copolymer or of a mixture based on an ethylene-vinyl alcohol copolymer, and
- a third layer of a mixture of a polyamide (A) and a polyolefin (B), wherein polyolefin (B) comprises:

(i) a high density polyethylene, and

either

(ii) a mixture of a polyethylene (C1) and a polymer (C2) selected from the group consisting of elastomers, very low density polyethylenes and ethylene copolymers, the mixture (C1) + (C2) being co-grafted with an unsaturated carboxylic acid,

or,

a mixture of:

(ii) a polymer (C2) selected from the group consisting of elastomers, very low density polyethylenes and ethylene copolymers, the polymer (C2) being grafted with an unsaturated carboxylic acid, and

(iii) a polymer (C'2) selected from the group consisting of elastomers, very low density polyethylenes and ethylene copolymers.

22. A structure according to claim 21, further comprising a layer of binder between the second and the third layer.

23. A structure according to claim 21, in which the binder comprises:

- 5 to 30 parts by weight per hundred of a polymer (D) which itself comprises a mixture of a polyethylene (D1) with a density of from 0.910 to 0.940 g/cm³ and of a polymer (D2) selected from the group consisting of elastomers, very low density polyethylenes and metallocene polyethylenes, the mixture (D1) + (D2) being co-grafted with an unsaturated carboxylic acid,
- 95 to 70 parts by weight per hundred of a polyethylene (E) with a density of from 0.910 to 0.930 g/cm³,
- the mixture of (D) and (E) being such that:
 - its density is from 0.910 to 0.930 g/cm³,
 - the content of grafted unsaturated carboxylic acid is between 30 and 10,000 ppm, and
 - the melt flow index, measured by ASTM D 1238, at 190°C and 2.16 kg, is between 0.1 and 3 g/10 min.

24. A structure according to claim 23, in which the density of the binder is from 0.915 to 0.920 g/cm³.

25. A structure according to claim 23, in which (D1) and (E) are LLDPEs which have the same comonomer.

26. A structure according to claim 21, in which the binder comprises:

- 5 to 30 parts by weight per hundred of a polymer (F) which itself comprises a mixture of a polyethylene (F1) with a density of from 0.935 to 0.980 g/cm³ and of a polymer (F2) selected from the group consisting of elastomers, very low density polyethylenes and ethylene copolymers, the mixture (F1) + (F2) being co-grafted with an unsaturated carboxylic acid,
- 95 to 70 parts by weight per hundred of a polyethylene (G) with a density of from 0.930 to 0.950 g/cm³,
- the mixture of (F) and (G) being such that:
 - its density is from 0.930 to 0.950 g/cm³,
 - the content of grafted unsaturated carboxylic acid is between 30 and 10,000 ppm,
 - the metal flow index, measured by ASTM D 1238 at 190°C and 21.6 kg, is between 5 and 100 g/10 min.

27. A structure according to claim 21, in which the binder is a polyethylene grafted with maleic anhydride, having a melt flow index, measured by ASTM D 1238 at 190°C and 21.6 kg, of 0.1 to 3 g/10 min, and a density of from 0.920 to 0.930 g/cm³.

28. A structure according to claim 27, in which the grafted polyethylene is diluted in a non-grafted polyethylene such that the binder is a mixture of 2 to 30 parts by weight per hundred of a grafted polyethylene with a density of from 0.930 to 0.980 g/cm³ and from 70 to

98 parts by weight per hundred of a non-grafted polyethylene with a density of from 0.910 to 0.940 g/cm³.

29. A structure according to claim 21, in which the binder is a mixture consisting of a HDPE, LLDPE, VLDPE or LDPE polyethylene, 5 to 35% by weight of a grafted metallocene polyethylene and 0 to 35% by weight of an elastomer, based on a total of 100% by weight.

30. A structure according to claim 21, in which the polyamide of the third layer is a copolyamide.

31. A structure according to claim 21, wherein the third layer comprises a polyolefin (B) which comprises:

- (i) a high density polyethylene and
- (ii) a mixture of a polyethylene (C1) and a polymer (C2) selected from the group consisting of elastomers, very low density polyethylenes and ethylene copolymers, the mixture (C1) + (C2) being co-grafted with an unsaturated carboxylic acid.

32. A structure according to claim 21, wherein the third layer comprises a polyolefin (B) which comprises:

- (i) a high density polyethylene,
- (ii) a polymer (C2) selected from the group consisting of elastomers, very low density polyethylenes and ethylene copolymers, the polymer (C2) being grafted with an unsaturated carboxylic acid and
- (iii) a polymer (C'2) selected from the group consisting of elastomers, very low density polyethylenes and ethylene copolymers.

33. (Canceled)

34. (Canceled)

35. A structure according to claim 21, in which the polyamide (A) of the third layer is selected from the group consisting of:

mixtures of (i) a polyamide and (ii) a copolymer containing polyamide-6 blocks and polytetramethylene glycol blocks, and

mixtures of (i) a polyamide and (ii) a copolymer containing polyamide-12 blocks and polytetramethylene glycol blocks,

the weight ratio of the amounts of copolymers (ii) and polyamides (i) being from 10:90 to 60:40.

36. A structure according to claim 35, in which the third layer comprises a polyolefin B, which comprises (i) a LLDPE, VLDPE or metallocene polyethylene and (ii) an ethylene-alkyl (meth)acrylate-maleic anhydride copolymer.

37. A structure according to claim 35, in which the third layer comprises a polyolefin (B) which comprises two functionalized polymers comprising at least 50 mol% of ethylene units and is crosslinkable.

38. A structure according to claim 22, in which the binder comprises:

- 5 to 30 parts by weight per hundred of a polymer (D) which itself comprises a mixture of a polyethylene (D1) with a density of from 0.910 to 0.940 g/cm³ and of a polymer (D2) selected from the group consisting of elastomers, very low density polyethylenes and metallocene polyethylenes, the mixture (D1) + (D2) being co-grafted with an unsaturated carboxylic acid,
- 95 to 70 parts by weight per hundred of a polyethylene (E) with a density of from 0.910 to 0.930 g/cm³,
- the mixture of (D) and (E) being such that:
 - its density is from 0.910 to 0.930 g/cm³,
 - the content of grafted unsaturated carboxylic acid is between 30 and 10,000 ppm, and
 - the melt flow index, measured by ASTM D 1238 at 190°C and 2.16 kg, is between 0.1 and 3 g/10 min.

- 39.** A structure according to claim 22, in which the binder comprises:
- 5 to 30 parts by weight per hundred of a polymer (F) which itself comprises a mixture of a polyethylene (F1) with a density of from 0.935 to 0.980 g/cm³ and of a polymer (F2) selected from the group consisting of elastomers, very low density polyethylenes and ethylene copolymers, the mixture (F1) + (F2) being co-grafted with an unsaturated carboxylic acid,
 - 95 to 70 parts by weight per hundred of a polyethylene (G) with a density of from 0.930 to 0.950 g/cm³, the mixture of (F) and (G) being such that:
 - its density is from 0.930 to 0.950 g/cm³,
 - the content of grafted unsaturated carboxylic acid is between 30 and 10,000 ppm,
 - the melt flow index, measured by ASTM D 1238 at 190°C and 21.6 kg, is between 5 and 100 g/10 min.

40. A device for transferring and/or storing fluids comprising a structure according to claim 21 such that the fluids so stored and/or transferred are in contact with the third layer side of the structure.

41. A device according to claim 40, wherein the device is a tube, a tank, a chute, or a bottle.

42. A device according to claim 40, wherein the device is a container.

- 43.** A structure according to claim 31, in which the third layer comprises:
- 60 to 70% by weight of polyamide (A)
 - 5 to 15% by weight of the co-grafted mixture of polyethylene (C1) and polymer (C2), and
 - the remainder of high density polyethylene.
- 44.** A structure according to claim 32, in which the third layer comprises:
- 60 to 70% by weight of polyamide (A)
 - 5 to 10% by weight of the grafted polymer (C2),
 - 5 to 10% by weight of polymer (C'2), and
 - the remainder of high density polyethylene.
- 45.** A structure according to claim 21, wherein the polyamide (A) in the third layer is a PA 6/6-6 copolymer of caprolactam, adipic acid and hexamethylenediamine.
- 46.** A structure according to claim 21, wherein the first layer has a thickness between 2 and 10 mm, the second layer between 30 and 500 μm and the third layer between 30 μm and 2 mm.
- 47.** A device according to claim 40, wherein the fluid is selected from the group consisting of petrol, oil, motor vehicle cooling fluid and air conditioning fluid.
- 48.** A device according to claim 40, wherein the fluid is petrol.

49. A structure according to claim 21, which consists essentially of:
- the first layer of high density polyethylene (HDPE),
 - the layer of binder,
 - the second layer of an ethylene-vinyl alcohol copolymer or of a mixture based on an ethylene-vinyl alcohol copolymer,
 - the third layer of a mixture of a polyamide (A) and a polyolefin (B), and
 - optionally, a layer of binder between the second layer and third layer.